Hiroshi INOUE*: **Taxonomic miscellany on hapatics (5)****

井上 浩*: 苔類の分類雑記 (5)

10. *Heteroscyphus coalitus* (Hook.) Schiffn., *H. communis* (Steph.) Schiffn. and *H. bescherellei* (Steph.) Hatt.

Heteroscyphus coalitus (Hook.) Schiffn. (or *Chiloscyphus c.*) was originally described from New Zealand based on a specimen collected at Dusky Bay (leg. Menzies; isotype in FH). It has been repeatedly suggested that *H. coalitus*, *H. communis* (Steph.) Schiffn. (in tropical southeastern Asia) and *H. bescherellei* (Steph.) Hatt. (in temperate Asia) are very closely allied each other and possibly conspecific (cf. Hattori, 1952); actually Hattori (1966) reduced *H. communis* to a synonym of *H. bescherellei* and Grolle & Schultze-Motel (1972) reduced *H. communis* to a synonym of *H. coalitus*. Kitagawa (1973) admitted the close affinities among these three species but he refrained "from placing *C. communis* into the synonymy of *C. bescherellei* or from combining both with *C. coalitus*".

Kitagawa (1973) considered the type of *Chiloscyphus coalitus* (=*Jungermannia coalita*) as "Auckland Island, Hooker, ex hb Kew, in herb. G", but this is apparently wrong (Bonner, 1976); he considered that the features as "very large-sized plants (over 5 mm wide and 6 cm long)", "deltoid leaves with spinose apical teeth", and "rounded (not distinctly bilobed) underleaves bearing six spinose marginal teeth and very broadly connate with leaves on both sides" of *C. coalitus* are distinct from *C. communis* and especially from *C. bescherellei*. *C. coalitus* in New Zealand and Australia is extremely polymorphic as already discussed by Hodgson (1943) and recently by Scott (1985); the underleaves of this species are typically rounded-quadrate with 4-6 spinose teeth, and the width of connection with leaves greatly varies as being 3-14 cells broad.

The leaf-shape of *Chiloscyphus coalitus* is also rather variable; the plants from Auckland Isl. have broadly trapezoidal leaves [approximately 2.6 mm long, 2.2 m wide at base or 1.6 mm wide at apex and 1.18 times as long as wide (of base)]; this is rather similar to the type from Dusky Bay (collected by Menzies) which also has trapezoidal leaves (approximately 2.2 mm long and 2 mm wide

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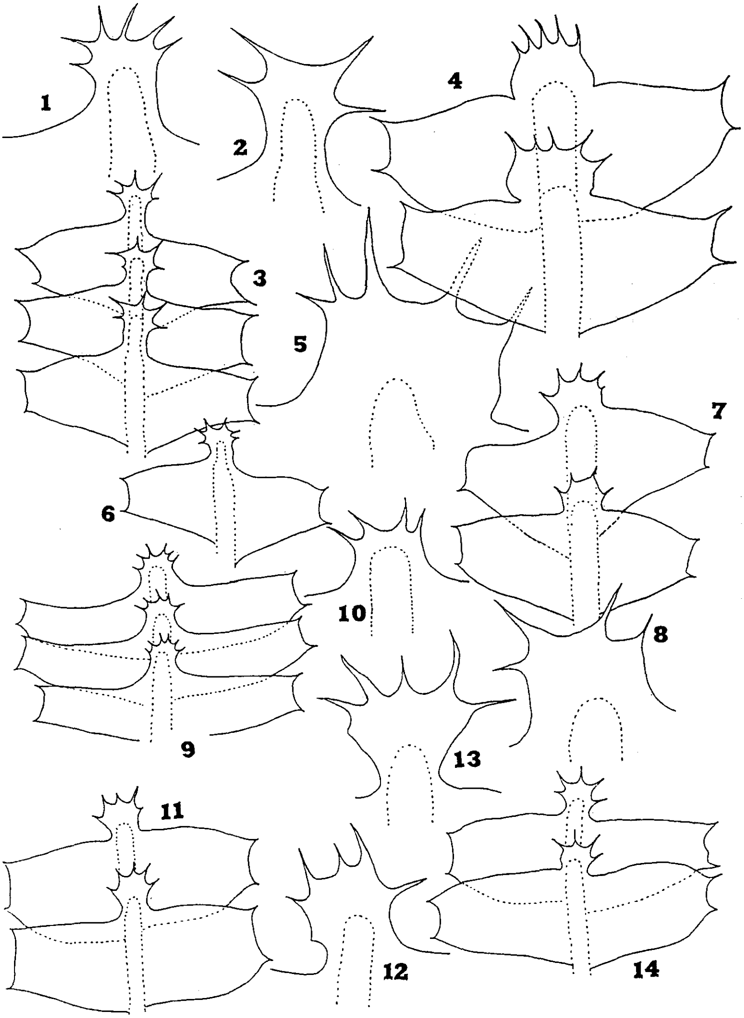

Fig. 1. Variations of *Heteroscyphus coalitus* (Hook.) Schiffn. 1. 2, 5, 8, 10, 12, 13. Underleaves, ×21. 3, 4, 6, 7, 9, 11, 14. Part of shoot, ventral view, showing connection of underleaves and leaves, ×8. 1-3, 6 based on Inoue 20438 from Japan; 4, 5 on type from New Zealand; 7, 8 on Ratkowsky 1332 from Tasmania; 9, 10 on Tan & Alvarez 77703 from Philippines; 11, 12 on Kalkman 4933B from New Guinea; 13, 14 on Manuel 2518 from Malaya.

at base or 0.8 mm wide at apex). However, most of the plants in New Zealand usually have broadly rectangular leaves, as illustrated by Allison & Child (1975) and Scott (1985). Although the plants from Auckland Isl. (coll. Hooker) are relatively robust, such robust form is never of taxonomic value in this extremely polymorphic complex.

The type of *Heteroscyphus communis* (=*Chiloscyphus communis* Steph.; Andaman Isl., leg. Mann in hb Levier, in G) is constituted by rather small plants, being 3–3.5 mm wide and 3–5 cm long, with moderately convex, rectangular leaves; the underleaves are not bilobed and have 4–6 spinose teeth and the width of connection with leaves is 3–8 cells broad; this rather small phenotype is also very commonly observed in Malaysia (as illustrated by Piippo, 1985, as *H. coalitus*), but the large-sized robust form of *C. communis* is also very frequent; I have observed large-sized plants in Malaya (cf. Inoue no. 10446 from Cameron Highlands, Pahang) and the nearly same phenotype was illustrated by Piippo (1985, as *H. coalitus*). Prior to the description of *C. communis*, this species was treated as *C. coalitus* and Schiffner (1900) said that "planta fere communis valde variabilis", recognizing several varieties and forms.

Heteroscyphus bescherellei known from subtropical and temperate Asia (type from Japan; coll. Faurie 12175 in G) also shows a great plasticity; rather common phenotype of this species was illustrated by Inoue (1974), and large, robust phenotype was once named as *H. bescherellei* var. *transiens* Hatt. (type from Yakushima Isl., Kagoshima Pref., coll. Hattori 7345 in NICH) ; the same phenotype was also collected from Yakushima Isl. (cf. Inoue 26864 in TNS), and these robust phenotype is reaching as large as 7–8 mm wide and more than 10 cm long. This robust form of *H. bescherellei* is almost identical with the type of *Chiloscyphus coalitus* (=*Jungermannia coalita*) from New Zealand.

The variations observed in the leaf- and underleaf-characters of the present complex are all continuous and many transitional forms exsist, and the variations are apparently caused by the habitat conditions (cf. humidity, light-intensity, etc.). I have studied long series of specimens of these closely allied species but I was not able to find any specific distinctions among them. Thus, the series of synonyms becomes as follow:

Heteroscyphus coalitus (Hook.) Schiffn., Oestr. Bot. Zeitschr. 60: 172 (1910).

Basionym: *Jungermannia coalita* Hook., Musci Exotici 2: 23, tab. 123 (1823).
=*Chiloscyphus coalitus* (Hook.) Nees in Gott. et al., Syn. Hepat.: 180 (1845).

Jungermannia affinis Reinw., Bl. & Nees, Nova Acta Acad. Caes. Leop. **12**: 205 (1825)=*Jungermannia coalita* Hook. var. *β affinis* (Reinw. et al.) Nees, Hepat. Jav.: 23 (1830)=*Chiloscyphus coalitus* (Hook.) Nees var. *affinis* (Reinw. et al.) Nees in Gott. et al., Syn. Hepat.: 180 (1845).

Jungermannia coalita Hook. var. *tenera* Nees, Hepat. Jav.: 23 (1830)= *Chiloscyphus coalitus* (Hook.) Dum. var. *tener* (Nees) Nees in Gott. et al., Syn. Hepat.: 181 (1845).

Chiloscyphus spruceanus Col., Trans. Proc. New Zealand Inst. **21**: 59 (1888), fide Hodgson (1943).

Chiloscyphus epibryus Col., Trans. Proc. New Zealand Inst. **21**: 58 (1888), fide Hodgson (1943).

Chiloscyphus bescherellei Steph., Bull. Herb. Boiss. **5**: 87 (1897)=*Heteroscyphus bescherellei* (Steph.) Hatt., Bot. Mag. Tokyo **58**: 39 (1944).

Heteroscyphus bescherellei (Steph.) Hatt. var. *transiens* Hatt., Journ. Hattori Bot. Lab. **3**: 20 (1948).

Lophocolea reflexistipula Steph., Hedwigia **28**: 265 (1899), fide Grolle & Piippo (1984).

Chiloscyphus porrigens Schiffn., Denkschr. Math.-Nat. Cl. K. Akad. Wiss. Wien **70**: 203 (1898).

Chiloscyphus coalitus (Hook.) Nees var. *angustus* Schiffn., Denkschr. Math.-Nat. Cl. K. Akad. Wiss. Wien **70**: 202 (1898).

Chiloscyphus coalitus (Hook.) Nees var. *grandiretis* Schiffn., Denkschr. Math.-Nat. Cl. K. Akad. Wiss. Wien **70**: 202 (1898).

Chiloscyphus coalitus (Hook.) Nees var. *sumatranus* Schiffn., Denkschr. Math.-Nat. Cl. K. Akad. Wiss. Wien **70**: 202 (1898).

Chiloscyphus communis Steph., Spec. Hepat. **3**: 211 (1907)=*Heteroscyphus communis* (Steph.) Schiffn., Oester. Bot. Zeitschr. **60**: 171 (1910).

Chiloscyphus irregularis Steph., Spec. Hepat. **3**: 214 (1907)=*Heteroscyphus irregularis* (Steph.) Hatt., Bull. Tokyo Sci. Mus. **11**: 43 (1944), fide Hattori (1952).

Lophocolea tamina Steph., Spec. Hepat. **6**: 295 (1922), fide Grolle & Piippo (1984).

Lophocolea sendaica Steph., Spec. Hepat. **6**: 292 (1922), fide Hattori (1952).

The distributional area of *Heteroscyphus coalitus* includes New Zealand (south to Auckland Isl.; Hodgson, 1943, as *C. communis*), Australia (Tasmania, Victoria, Queensland; Stephani, 1906–8; Scott & Bradshaw, 1986, *as C. coalitus*), Samoa (Grolle & Schultze-Motel, 1972, *as C. coalitus*), Micronesia (Miller, 1968, as *C. communis*), New Guinea (Grolle & Piippo, 1984, as *H. coalitus*), Indonesia (Java, Sumatra, Celebes, Borneo; Schiffner, 1989, as *C. coalitus*), Malaya, Andaman Isls. (Stephani, 1906–8, as *C. communis*), India-Himalayas-China-Philippines (Hattori, 1966, as *H. bescherellei*), Taiwan-Japan (Inoue, 1974, as *H. bescherellei*), and Korea (Choe, 1980, as *H. bescherellei*).

11. Range extension of two Indomalaysian hepatics.

Among the recent collections made from northern Queensland, Australia, following two interesting species were found to be new to Australian flora.

Notoscyphus lutescens (Lehm. & Lindbg.) Mitt. in Seeman, Fl. Viti: 407 (1871).

Specimen examined. Along Gillies Hwy between Carins and Yungaburra, Queensland, leg. M. L. Hicks 10889 (TNS).

This species has been known from Hawaii Isl, Samoa, New Guinea, westwards to India and northwards to southern Japan. The plants from Queensland are frequently fertile, and the male and female plants are intermingled. The oil bodies were 2–6 per leaf-cell, brownish, and 6–12×6–20 m.

Wettsteinia inversa (S. Lac.) Schiffn., Ann. Jard. Bot. Buitenz 2, suppl.: 45 (1398).

Specimen examined. Lamington National Park, Mt. Bethongabel, Queensland, leg. B. M. Thiers 1236 (NY, TNS).

This species has been known from New Guinea, Java, Sumatra, Borneo, Philippines, and Taiwan. In Queensland this species was collected on humus in subtropical rainforest dominated by *Nothofagus moorei*, at elevation about 900 m The plants are rather small, being 1–3 cm long.

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10. アジア温帯に広く分布するオオウロコゴケ *Heteroscyphus bescherellei* と東南アジア熱帯に広く分布する *H. communis*, ニュージランド, オーストラリアからニューギニアにかけて知られる *H. coalitus* の関係については, 色々な議論がなされて来たが, この3種は基本的には一つの種として考えられる。変異が著しく, しかもこの変異が種として区別出来るようなものではないことが明らかになった。

11. 東南アジアに分布が知られていた *Notoscyphus lutescens* ならびに *Wettsteinia inversa* の2種が, オーストラリアのクイーンズランドにまで分布していることが明らかとなった。